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OCCUPATIONAL HEALTH AND SAFETY RESEARCH IN THE U.S. ARMY: COMPARABILITY WITH CIVILIAN EMPLOYEE COHORTS

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Problem- Characteristics distinguishing the U.S. Army as an occupational cohort have been used as arguments against conducting occupational health and safety research in the military.
Method - Military occupation codes were mapped to civilian standard occupation codes (SOC) and counts of Army personnel by job, and proportions were compared with Bureau of Labor Statistics estimates of the distribution of civilian jobs.
Results -Seventy-two percent of enlisted personnel, 65% of commissioned officers and 61% of warrant officers had jobs with direct civilian counterparts. Proportions of Army and civilian workforces were nearly identical for some SOC (e.g., transportation, material moving).
Conclusion - The majority of Army personnel have jobs with civilian counterparts. Occupational research in the Army focusing on specific jobs and job tasks will be relevant to many civilians.

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LIST OF ACRONYMS

DMDC	Defense Manpower Data Center
MOC	Military occupation codes
SOC	Standard occupation codes
BLS	U.S. Bureau of Labor Statistics

INTRODUCTION

The U.S. Army employs nearly 500,000 people each year in a wide variety of jobs. Although easily considered a major employer, characteristics that distinguish this occupational cohort from others are often viewed as sources of non-comparability and as arguments against conducting research in the military setting. However, there are a number of practical benefits to conducting occupational health research in the Army: the population is fully enumerated, soldiers are required to be free of major illness at recruitment, and medical care is equally accessible to all. Women and ethnic minorities are better represented than in most occupational cohorts, and thus may serve as sentinels for identifying health problems expected to emerge with improved integration of the civilian workforce. The immediate availability of occupational and health data in electronic form, including the tracking of time-dependent information, makes many research efforts cost-efficient. In spite of these advantages, occupational health studies based on military populations are often viewed as irrelevant to questions of civilian occupational health. This short report demonstrates that, at least based on the distribution of job titles in the Army and civilian work forces, this view is wasteful of a potentially powerful and useful resource for occupational safety and health research.

METHODS

Information provided by the Defense Manpower Data Center (DMDC) linked military occupation codes (MOC) and civilian standard occupational codes (SOC) as well as counts of Army personnel within each MOC as of the end of February 2002. These data group military personnel into civilian job codes according to training and qualifications.

Information regarding overall force strength and distribution across broad groups of pay grades (enlisted, warrant and commissioned officers) as of January 2001 was abstracted from the Army Almanac (5). For comparison, summary data from the 2000 Occupational Employment Statistics Survey conducted by the U.S. Bureau of Labor Statistics (BLS) describing the distribution of major occupational groups in the civilian employed population were obtained from the BLS website (1).

Using the DMDC data as numerators and the force strength estimates from the Army Almanac as denominators, the distribution within the Army population of specific jobs coded according to both the military (MOC) and civilian (SOC) systems could be calculated. This was done separately for enlisted personnel and warrant and commissioned officers. Since the time periods for the job-specific and force strength counts are not identical, the proportionate distribution of jobs reported here is an estimate based on the assumption that the overall force strength and the number of enlisted and warrant and commissioned officers remained fairly stable between January 2001 and February 2002.

RESULTS

There were 479,026 personnel on active duty in the Army at the beginning of 2001. Of these, 84% were enlisted grade or noncommissioned officers (E1-E9), 2.4% were warrant officers, and 13.6% were commissioned officers (Table 1).

Table 1. Distribution of U.S. Army personnel by broad pay-grade grouping, January 2001

Rank	Number	Percent
Enlisted (E1-E9)	402,150	84.0
Warrant Officer	11,524	2.4
Commissioned Officer	65,352	13.6
Total	479,026	100.0

Data from Army Almanac, http://www.army.mil/soldiers/pdfs/sitrep.pdf

For all ranks combined, the DMDC data contained a total of 697 MOCs and 457 SOCs. Some MOCs were associated with multiple SOCs, and vice versa. In order to identify all unique MOCs without duplication, it was necessary to sort by and retain unique combinations of MOC and personnel count. This resulted in a database that links single MOCs to multiple SOCs and counts each person only once.

The 15 most common job titles for personnel of enlisted rank (E1-E9) accounted for nearly 50% of the enlisted population and are shown in Table 2. Only three of the top 15 job titles had no civilian counterpart (infantry; armored assault vehicle crew member; and artillery missile crew member). Overall, nearly three-quarters of the total enlisted population (72%, N=282,165) was employed in a job with a corresponding civilian job title. Twenty-eight percent (N=110,290) had jobs that were military-only (i.e., had no civilian counterpart; not shown).

Table 2. Fifteen most common jobs for enlisted personnel, April 2002

SOC[1]	SOC TITLE[2]	MOC TITLE[2]	Frequency	Cum Frequency[3]	Percent[4]	Cum Percent[3,4]
	Infantry	Infantryman	43,783	43,783	10.89	10.89
29	Emergency Medical Technicians and Paramedics	Medical Specialist	17,140	60,923	4.26	15.15
43	Shipping, Receiving, and Traffic Clerks	Unit Supply Specialist	13,789	74,712	3.43	18.58
33	Correctional Officers and Jailers	Military Police	13,526	88,238	3.36	21.94
43	Shipping, Receiving, and Traffic Clerks	Automated Logistical Specialist	12,633	100,871	3.14	25.08
53	Truck Drivers, Heavy and Tractor-Trailer	Motor Transport Operator	11,371	112,242	2.83	27.91
49	Automotive Service Technicians and Mechanics	Light Wheel Vehicle Mechanic	11,045	123,287	2.75	30.66
	Armored Assault Vehicle Crew Members	M1 Armor Crewman	10,364	133,651	2.58	33.23
35	Cooks, Institution and Cafeteria	Food Services Specialist	10,135	143,786	2.52	35.75
43	Executive Secretaries and Administrative Assistants	Administrative Specialist	9,619	153,405	2.39	38.15
	Artillery and Missile Crew Members	Cannon Crewmember	9,603	163,008	2.39	40.53
47	Brickmasons and Blockmasons	Combat Engineer	8,782	171,790	2.18	42.72
53	Pump Operators, Except Wellhead Pumpers	Petroleum Supply Specialist	8,232	180,022	2.05	44.76
	Armored Assault Vehicle Crew Members	Cavalry Scout	7,650	187,672	1.90	46.67
27	Radio Operators	Signal Support Systems Specialist	7,480	195,152	1.86	48.53

1. SOC: Major SOC group to which title belongs. Presented only for jobs with civilian counterparts.
2. SOC title: Standard occupational category title. MOC title: Military occupational code title.
3. Cum: Cumulative
4. Percentages based on the total enlisted population of 402,150 persons.

The proportion of commissioned officers holding jobs with civilian counterparts was similar to the proportion among the enlisted personnel (65.2%, N=41,788). The fifteen most common job titles accounted for 64% of the population. Among these, four were military-only (infantry officers; armored assault vehicle officers; artillery and missile officers; and military officer/special and tactical operations, leaders/managers; Table 3).

Table 3. Fifteen most common jobs for commissioned officers, April 2002

SOC[1]	SOC TITLE[2]	MOC TITLE[2]	Frequency	Cum Frequency[3]	Percent[4]	Cum Percent[3,4]
	Infantry Officers	Infantry	6,212	6,212	9.51	9.51
	Artillery and Missile Officers	Field Artillery, General	4,721	10,933	7.22	16.73
	Armored Assault Vehicle Officers	Armor, General	3,654	14,587	5.59	22.32
	Military Officer Special and Tactical Operations Leaders/Managers, All Other	All Source Intelligence	3,486	18,073	5.33	27.65
53	Commercial Pilots	Aviation, General	3,338	21,411	5.11	32.76
29	Registered Nurses	Medical-Surgical Nurse	2,857	24,268	4.37	37.13
11	Computer and Information Systems Managers	Signal, General	2,655	26,923	4.06	41.20
11	Medical and Health Services Managers	Health Services	2,624	29,547	4.02	45.21
11	Transportation, Storage, and Distribution Managers	Transportation, General	2,199	31,746	3.36	48.58
17	Civil Engineers	Combat Engineer	2,012	33,758	3.08	51.66
17	Civil Engineers	Engineer, General	1,664	35,422	2.55	54.20
11	First-Line Supervisors/Managers, Law Enforcement Workers	Military Police	1,654	37,076	2.53	56.73
11	Logisticians	Maintenance Management	1,640	38,716	2.51	59.24
11	Purchasing Managers	Quartermaster, General	1,431	40,147	2.19	61.43
21	Clergy	Command and Unit Chaplain	1,372	41,519	2.10	63.53

1. SOC: Major SOC group to which title belongs. Presented only for jobs with civilian counterparts.
2. SOC title: Standard occupational category title. MOC title: Military occupational code title.
3. Cum: Cumulative
4. Percentages based on the total enlisted population of 402,150 persons.

Nearly 83% of warrant officers (82.6%, N=8,266) had job titles with civilian counterparts, and 17% (N=1,746) had military-only jobs (not shown). Among the fifteen most common job titles, accounting for 61% of the warrant officers, only one (military officer, special and tactical operations, leaders/managers, all other) could be considered military-only (Table 4).

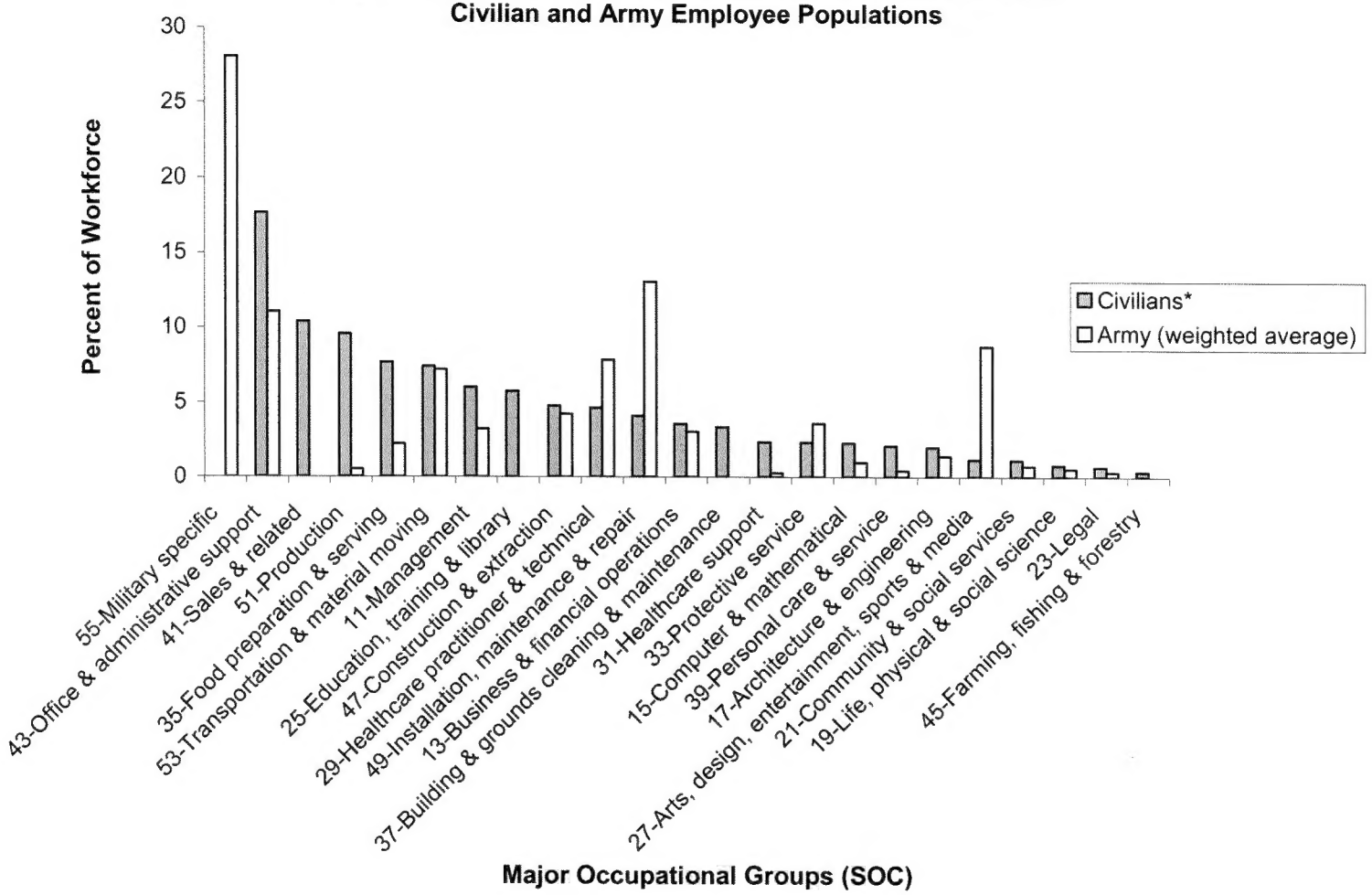
Table 4. Fifteen most common jobs for warrant officers, April 2002

SOC[1]	TITLE[2]	MOC TITLE[2]	Frequency	Cum Frequency[3]	Percent[4]	Cum Percent[3,4]
53	Commercial Pilots	UH-60 Pilot	1,680	1,680	14.58	14.58
53	Commercial Pilots	OH-58D Pilot	725	2,405	6.29	20.87
53	Commercial Pilots	AH-64A Attack Pilot	680	3,085	5.90	26.77
11	Transportation, Storage, and Distribution Managers	Unit Maintenance Officer	454	3,539	3.94	30.71
12	Transportation, Storage, and Distribution Managers	Support Maintenance Officer	442	3,981	3.84	34.55
53	Commercial Pilots	AH-64D Attack Pilot	421	4,402	3.65	38.20
11	Purchasing Managers	Property Accounting Technician	406	4,808	3.52	41.72
	Special Forces Officers	Special Forces Warrant Officer	385	5,193	3.34	45.06
53	Commercial Pilots	CH-47D Pilot	372	5,565	3.23	48.29
11	First-Line Supervisors/Managers, Law Enforcement Workers	CID Special Agent	352	5,917	3.05	51.35
11	Purchasing Managers	Supply Systems Technician	287	6,204	2.49	53.84
	Military Officer Special and Tactical Operations Leaders/Managers, All OTHER	Counterintelligence Technician	229	6,433	1.99	55.82
11	Human Resources Managers	Military Personnel Technician	215	6,648	1.87	57.69
11	Transportation, Storage, and Distribution Managers	Aviation Maintenance Technician (Non-rated)	213	6,861	1.85	59.54
53	Airline Pilots, Copilots, and Flight Engineers	C-12 Pilot	180	7,041	1.56	61.10

1. SOC: Major SOC group to which title belongs. Presented only for jobs with civilian counterparts.
2. SOC title: Standard occupational category title. MOC title: Military occupational code title.
3. Cum: Cumulative
4. Percentages based on the total enlisted population of 402,150 persons.

To facilitate comparisons between the proportions of Army and civilian workforces holding specific jobs, the first two-digits of the SOC codes designating major occupational groups are shown in all tables. For example, among enlisted personnel, the most common job title (SOC) with a civilian counterpart was emergency medical technicians and paramedics, corresponding to major occupational group code 29 and accounting for 4.3% of the enlisted population (Table 2). In the civilian workforce, this group ranked ninth and accounted for 4.5% of the population (Figure 1). Figure 1 can also be used for more general comparisons of the distribution of major occupational groups in the civilian employee population compared to the Army, averaged over the three broad pay-grade groups. Some of the major occupational groups, such as transportation & material moving and construction & extraction, are nearly equally represented in the two cohorts. Other occupational groups are overrepresented in one cohort versus the other. For example, production and food preparation & serving are much more common in the civilian workforce, whereas jobs classified as installation, maintenance & repair are more common in the military.

Figure 1. Distribution of Major Occupational Groups (SOC) in Civilian and Army Employee Populations



* Civilian labor force aged 16 years and older for January 2000. Data from the Bureau of Labor Statistics Occupational Employment Statistics Survey, 2000 (http://www.bls.gov/oes).

DISCUSSION

The phrase "occupational health and safety in the Army" may conjure notions of battle injuries and Meals Ready-to-Eat, but today's Army largely comprises individuals in what may be thought of as civilian occupations. From these data, it can be seen that, at least during 2001, more than 70% of active duty military personnel were employed in jobs that had direct civilian counterparts.

About 500,000 people are on active duty in the Army annually, making this occupational cohort comparable in size to that of the top three Fortune 100 companies: Wal-Mart Stores, Inc. (1.3 million)(6), Exxon-Mobil Corporation (about 100,000)(2) and General Motors (386,000)(3). It is acknowledged that the physical working conditions and the work place culture and environment found in the Army may be markedly different from those found in civilian workplaces. Inasmuch as these factors may play a role in the incidence, reporting, treatment and recovery from occupational illness and injury, the Army as an employer may not be directly comparable to all civilian employers in the United States. Furthermore, the Army population differs from the population of U.S. working adults in some other respects that may be related to health outcomes. For example, the Army population is, on average, younger than the U.S. working population(4), and there is a higher likelihood of physical fitness within the military due to the requirements of combat readiness.

When jobs were grouped according to major SOC categories, the distribution found in the Army and the civilian employed populations differed, meaning that general statements regarding the comparability of the two groups cannot be made. This situation is no different than would be expected when any large, heterogeneous groups are compared, and speaks only to the need to avoid misclassification that arises from the creation of too-broad exposure or potential exposure categories. However, occupational health studies conducted within the Army that focus on safety or health risks associated with specific jobs and job tasks are likely to be relevant to a large number of civilians.

While there are economic consequences of employee illness and injury in both the military and civilian settings, costs of illness and injury in the Army are passed directly to taxpayers. Effective health and safety measures in the Army both improve the well being of a large segment of the population and result in substantial cost savings for the general public.

The similarity of jobs in each sector and the practical advantages of working in a defined, closed system outweigh the interpretational difficulties that arise from the differences between the civilian and Army workforces. The differences between cohorts noted here may affect the generalizability of results, but internal validity is not compromised, and findings can inform the development of preventive measures for both workforces. Collaboration between sectors will lead to progress towards addressing shared challenges in providing a safe workplace and protecting employee health.

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